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CHAPTER 1

Automegasamdri®-915B, Series B Overview

1

Automegasamdri®-915B, Series B CPD Dryer CLEAN ROOM UNIT

Automegasamdri®- 915B, Series B System includes Automegasamdri®-915B, Series B Dryer, SOTER™ Condenser, HF Compatible Wafer/Chip Holders, Chamber Inserts, and the LCO_2 Filter.

tousimis® Catalog #8785C (Automegasamdri®- 915B)

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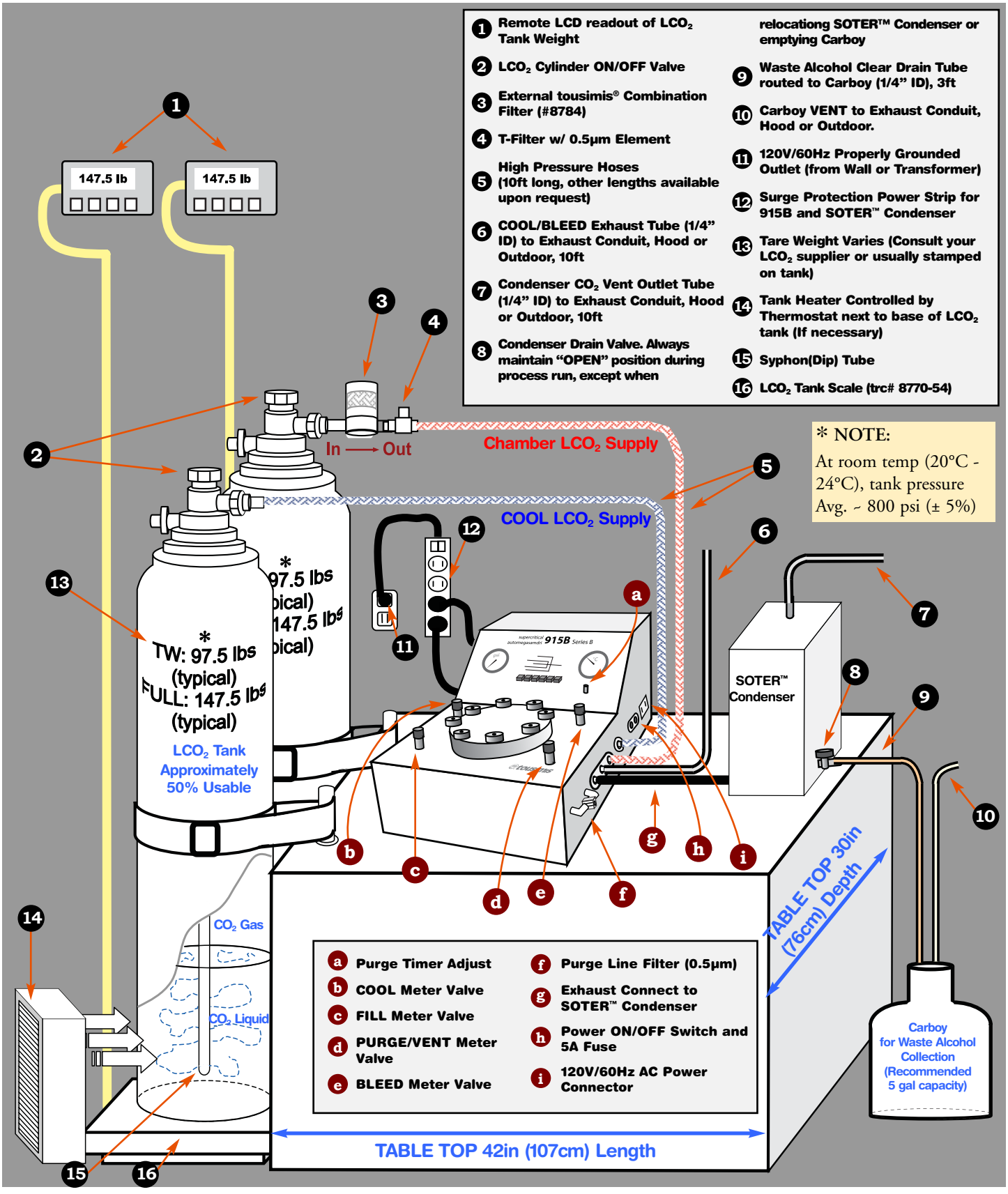
Automegasamdri®-915B, Series B Setup Overview


1 Remote LCD readout of LCO_2 Tank Weight
2 LCO_2 Cylinder ON/OFF Valve
3 External tousimis® Combination Filter (#8784)
4 T-Filter w/ 0.5µm Element
5 High Pressure Hoses (10ft long, other lengths available upon request)
6 COOL/BLEED Exhaust Tube (1/4" ID) to Exhaust Conduit, Hood or Outdoor, 10ft
7 Condenser CO_2 Vent Outlet Tube (1/4" ID) to Exhaust Conduit, Hood or Outdoor, 10ft
8 Condenser Drain Valve. Always maintain "OPEN" position during process run, except when relocationg SOTER™ Condenser or emptying Carboy
9 Waste Alcohol Clear Drain Tube routed to Carboy (1/4" ID), 3ft
10 Carboy VENT to Exhaust Conduit, Hood or Outdoor.
11 120V/60Hz Properly Grounded Outlet (from Wall or Transformer)
12 Surge Protection Power Strip for 915B and SOTER™ Condenser
13 Tare Weight Varies (Consult your LCO_2 supplier or usually stamped on tank)
14 Tank Heater Controlled by Thermostat next to base of LCO_2 tank (If necessary)
15 Syphon(Dip) Tube
16 LCO_2 Tank Scale (trc# 8770-54)
147.5 lb
147.5 lb
In → Out
Chamber LCO_2 Supply
COOL LCO_2 Supply
* NOTE:
At room temp (20°C - 24°C), tank pressure Avg. ~ 800 psi (± 5%)
* 97.5 lbs (typical) 147.5 lbs (typical)
* TW: 97.5 lbs (typical) FULL: 147.5 lbs (typical)
LCO_2 Tank Approximately 50% Usable
SOTER™ Condenser
CO_2 Gas
CO_2 Liquid
a Purge Timer Adjust
b COOL Meter Valve
c FILL Meter Valve
d PURGE/VENT Meter Valve
e BLEED Meter Valve
f Purge Line Filter (0.5µm)
g Exhaust Connect to SOTER™ Condenser
h Power ON/OFF Switch and 5A Fuse
i 120V/60Hz AC Power Connector
TABLE TOP 30in (76cm) Depth
TABLE TOP 42in (107cm) Length
Carboy for Waste Alcohol Collection (Recommended 5 gal capacity)

CHAPTER 2

Installing Automegasamdri®-915B, Series B

2

PREPARATION OF INSTALLATION SITE

Insist on clean surfaces. Minimum table top space requirement of approximately 42"(107cm) width x 30"(76cm) depth should be allotted for the Automegasamdri®-915B, Series B and SOTER™ Condenser. An additional 24"(61cm) x 36"(92cm) of floor space for the LCO_2 tanks and ceramic heater (if necessary) needs to be designated at install site (See p.3).
Use bone-dry LCO_2 with a Siphon (Dip) Tube tank only. Never use pressurized LCO_2 with Helium or any other high pressure head substitute gas tanks. Use only LCO_2 with minimum 99.8% purity.
Secure LCO_2 tank according to your facility's safety protocol.
Tank pressure typically reads 800psi (±5%) at room temperature. The amount of LCO_2 in tank is best monitored with a LCO_2 tank scale (See p.3).

NOTE:
Always order LCO_2 tanks with Siphon (Dip) tubes.

BOC gas suppliers refer to 99.8% purity grade as "2.8" grade.

Air Products gas suppliers refer to 99.8% purity grade as "CP" grade.

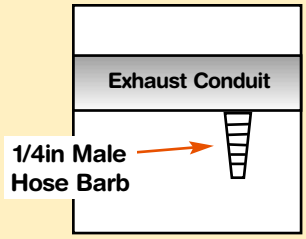
Typical nominal LCO_2 tank weights for Net / 50lb (23kg) LCO_2 tanks:

- Full tank: 140-170lbs (63.5-77kg) / Tare of tank: 90-120lbs (41-54.5kg)
- Most of the time, you may use 50% of the net LCO_2 weight within the tank.
- It is good practice to have spare LCO_2 tanks stored in reserve in case a tank runs out of LCO_2 during mid process.

• A properly grounded 120V / 50-60Hz outlet should be located within 4ft of install site.

• Two 1/4" male hose barbs should be installed into the exhaust conduit within 10ft of installation site to connect CO_2 gas exhaust lines. One exhaust line is from the COOL / BLEED Exhaust, while the other is from the SOTER™ Condenser Vent Exhaust.

NOTE:
It is best to route Exhaust Tubing to facility Exhaust Conduit and attach via 1/4in male hose barb to conduit.



INSTALLATION OF THE AUTOMEGASAMDRI® -915B, Series B

• Attach the HIGH PRESSURE HOSE with the pre-installed #8784 LCO_2 Filter Assembly onto the CHAMBER SUPPLY LCO_2 Inlet Connect. No Teflon® tape is required.

• Next, attach the HIGH PRESSURE HOSE without the LCO_2 Filter Assembly onto the COOL SUPPLY LCO_2 connect. No teflon tape is required.

• Gently tighten the High Pressure Female Connector using the two open-end wrenches supplied (one on the hose and the other on the Inlet). Stop at the feel of first resistance; re-tighten if necessary, should it leak.

(See "Connecting High Pressure Hose to Automegasamdri®-915B, Series B" on p.5)

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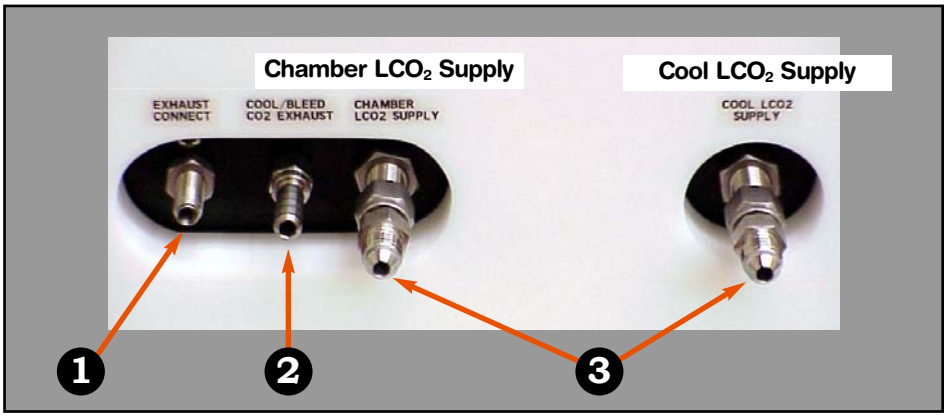
Automegasamdri®-915B, Series B Inlet / Outlet Connect

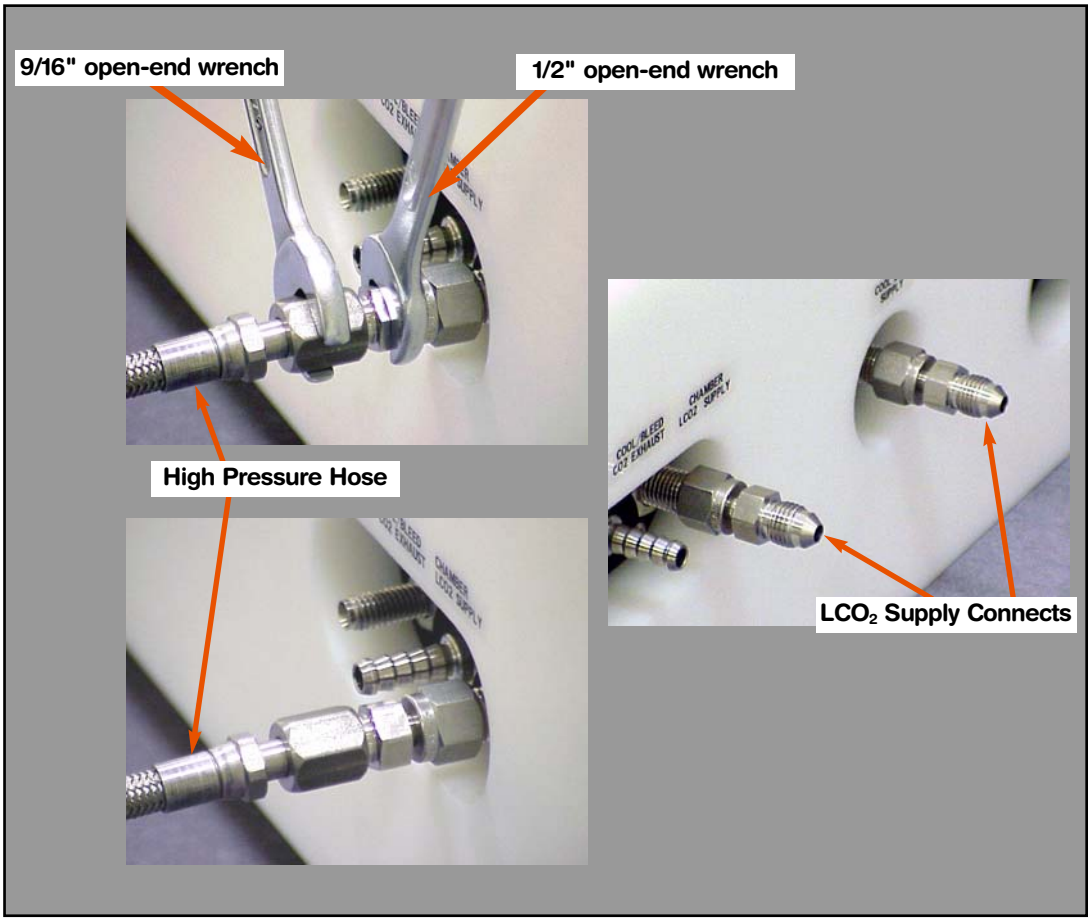
1. Exhaust Connect to SOTER™ Condenser
2. COOL / BLEED CO_2 Exhaust Outlet
3. LCO_2 Supply Connects



Connecting High Pressure Hose to Automegasamdri®-915B

NOTE:
To attach LCO_2 high-pressure hose end fittings to the 915B LCO_2 connects, you will need the 9/16" and a 1/2" open-end wrenches supplied.
First, slide 1/2" wrench over 1/2" fitting as shown in the photo. The 1/2" wrench will be used to hold the connect assembly steady as you gently tighten the high pressure hose end fitting snugly onto each of the LCO_2 Supply Connects using the 9/16" wrench.

DO NOT OVER-TIGHTEN



Insert the Filter Element (#8784A) into the tousimis® Combination Filter (#8784) before you open the LCO_2 tank valve. The 0.5µm filter has been pre-installed.

(See schematic furnished, p.17, 18)

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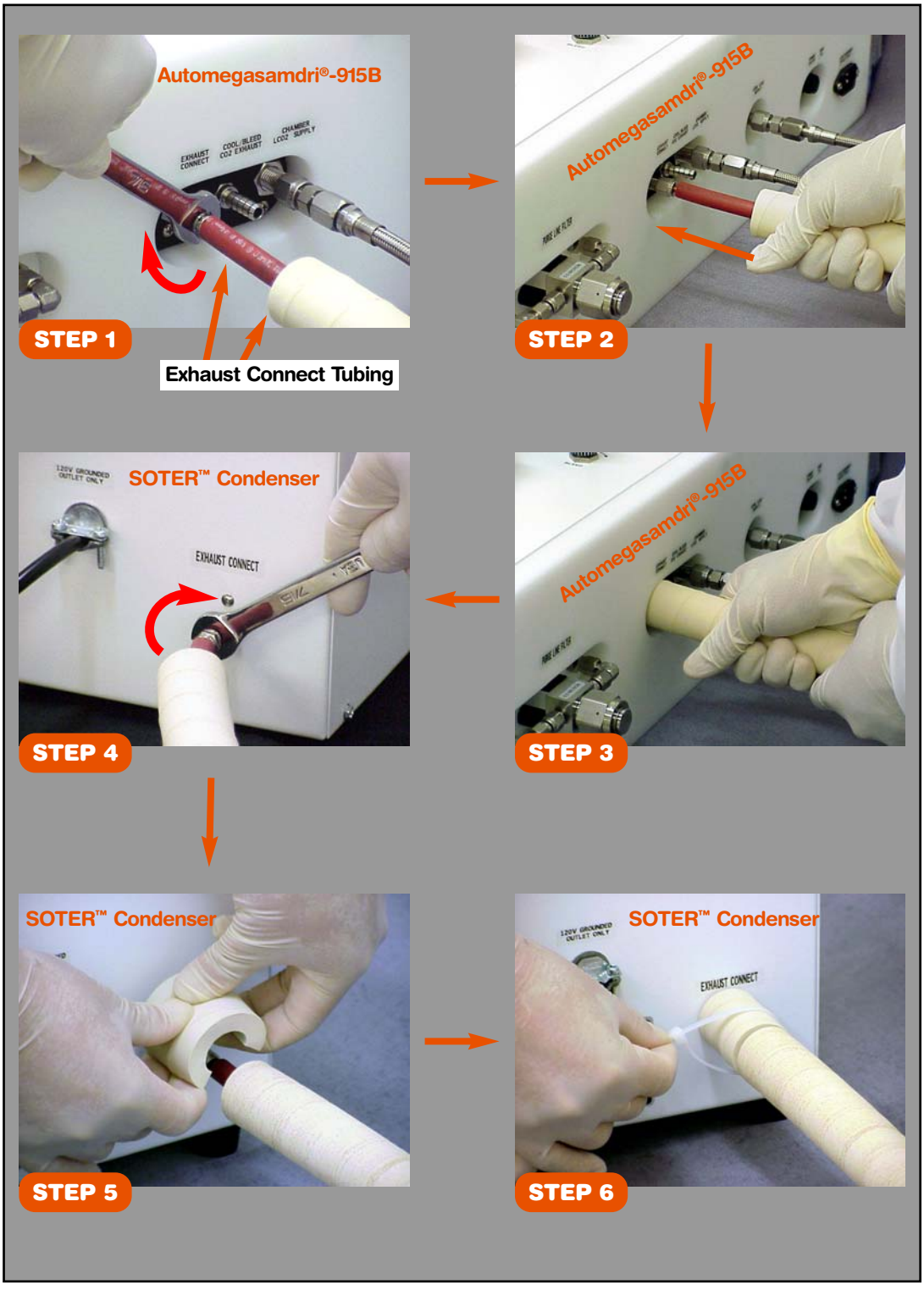
Connecting SOTER™ Condenser to Automegasamdri®-915B

Attach the insulated Exhaust Connect Tubing to the "EXHAUST CONNECT" of the 915B.
Connect the other end to the SOTER™ Condenser "EXHAUST CONNECT".
Use 7/16" open-end wrench provided to make these connections (Steps 1-6)
DO NOT OVER-TIGHTEN.



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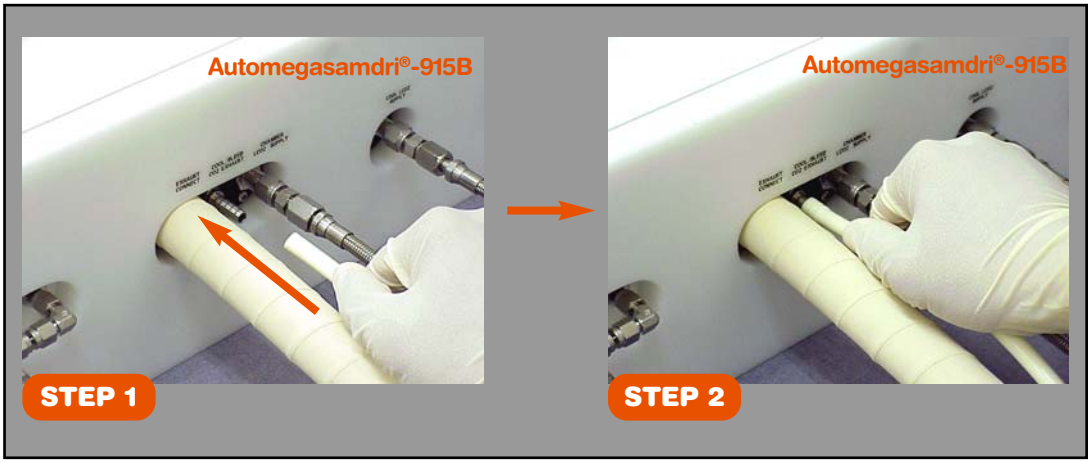
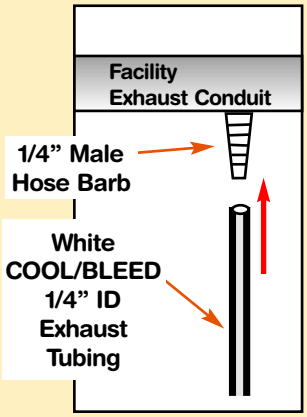
Connecting COOL/BLEED Exhaust Hose to 915B

Attach the 10ft White exhaust tubing provided to the COOL/BLEED Exhaust outlet on the Automegasamdri®-915B, Series B.



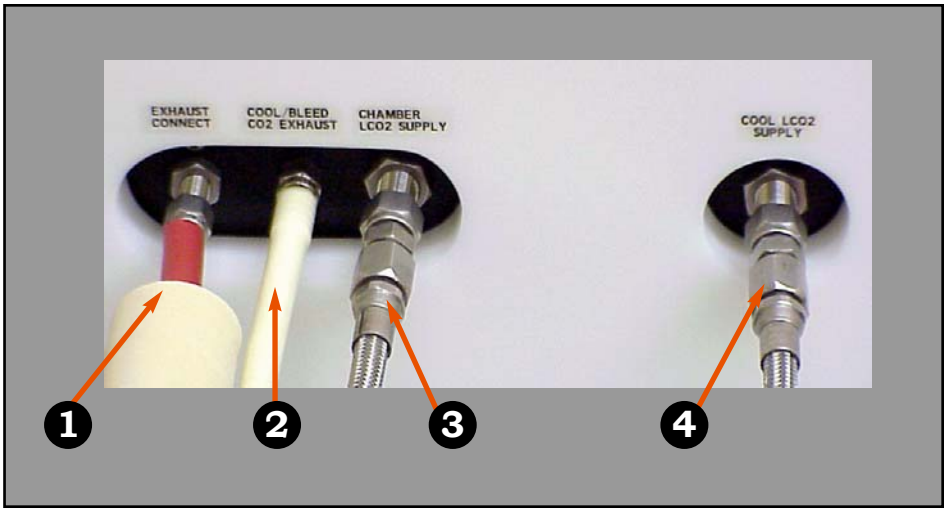
Tubing should be free of kinks which could block passage of rapidly exiting noisy gas or solid flakes of CO_2.

NOTE:
It is best to route CO_2 gas Exhaust Tubing to facility Exhaust Conduit and attach via 1/4" male hose barb to conduit.



Inlet / Outlet Set-Up

1. **Exhaust Connect Outlet to SOTER™ Condenser**
2. **COOL / BLEED CO_2 Exhaust Outlet**
3. **CHAMBER LCO_2 Supply Connect**
4. **COOL LCO_2 Supply Connect**



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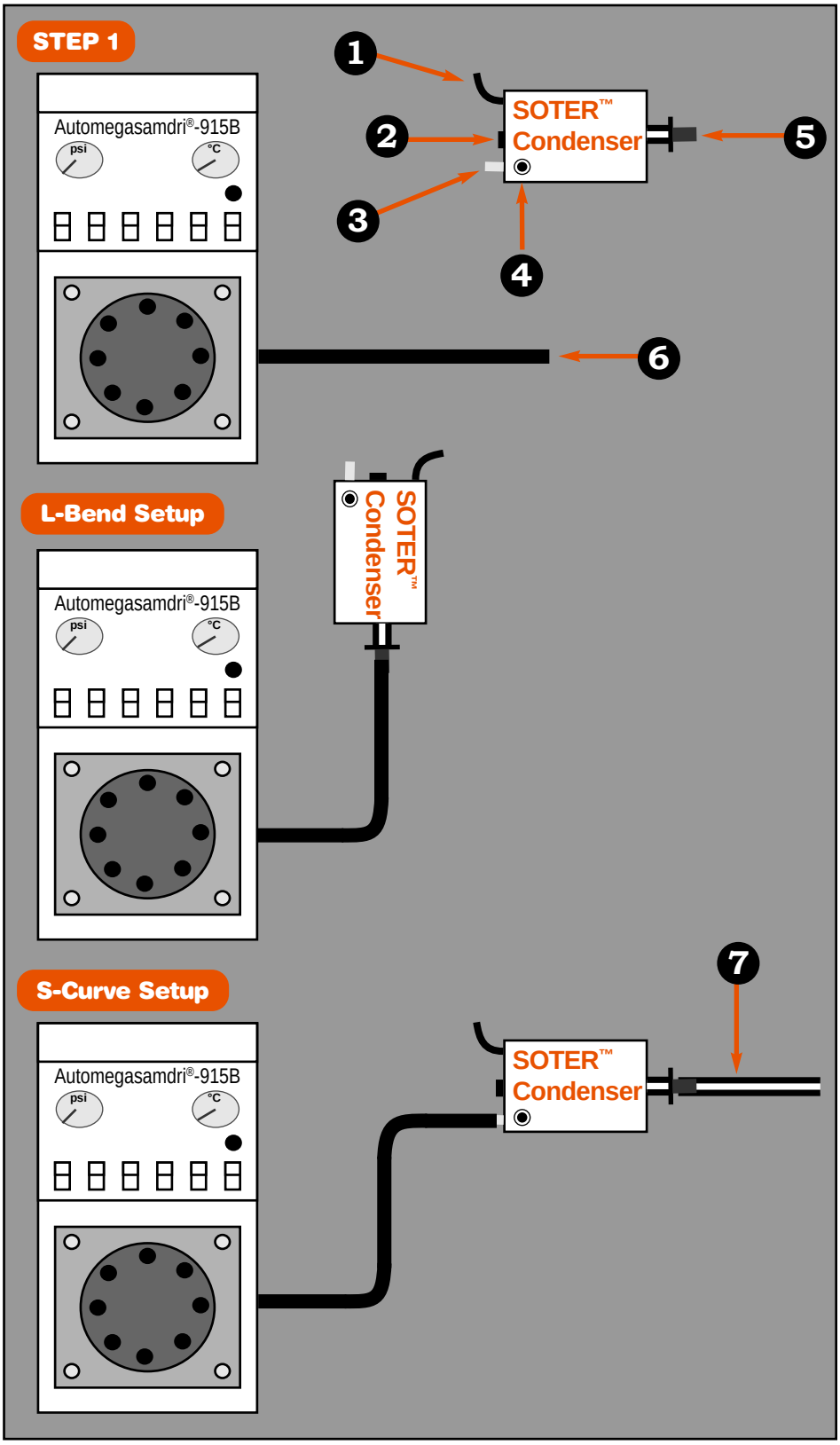
SOTER™ Condenser Exhaust Connect Overview

1. 120V Power Cord
2. Power ON / OFF Switch for SOTER™ Condenser and 2A Fuse
3. Exhaust Connect to Automegasamdri®-915B
4. Vent Outlet (Attach 10' White Exhaust Tubing and route to Exhaust Conduit)
5. Waste Alcohol Drain Valve
6. Exhaust Connect to SOTER™ Condenser
7. Attach 3ft length of clear Condenser drain tubing and lead to waste alcohol collection container or solvent drain.



NOTE:

- Do not make any hard 90° Bends in Exhaust Connect.
- Either a gradual "S" curve or a gradual “L” bend is desirable.
- Do not over-tighten fittings on either end of Exhaust Connect.
- Check for leaks during initial process run after completing all connections.
- Tighten as necessary.

DO NOT OVER-TIGHTEN

U.S. Patent #6,493,964 covers SOTER™ CONDENSER

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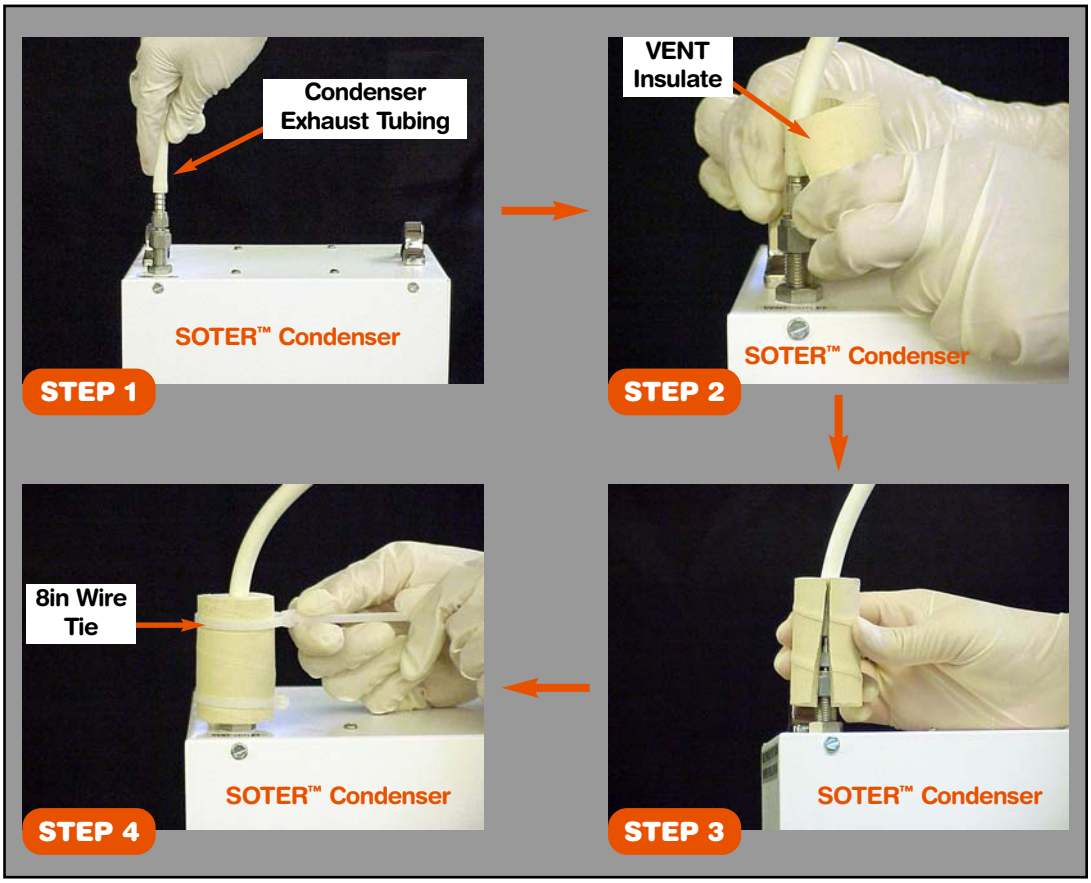
Connecting SOTER™ Condenser Exhaust Tubing

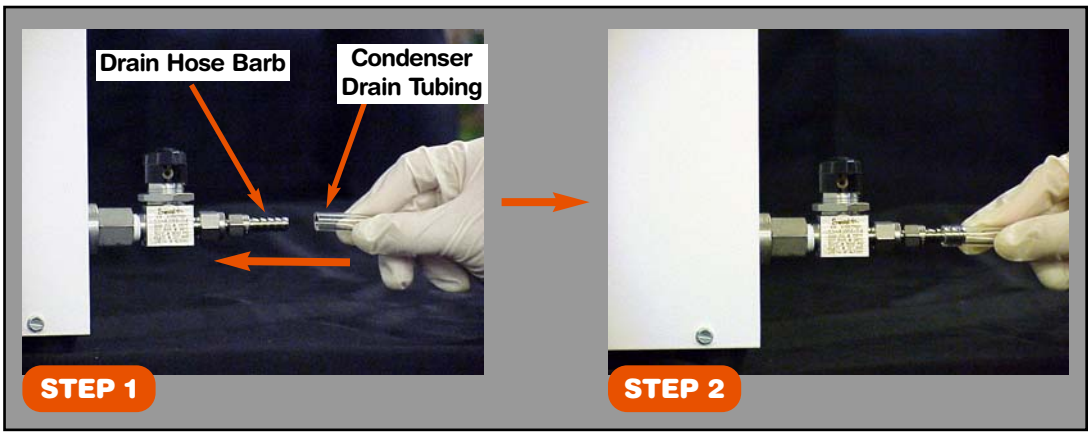
• Connect the white 10ft length of 'Condenser Exhaust Tubing' to the Condenser 'Vent Outlet' (Step 1) and cover the 'Vent Outlet' with the provided 'Vent Outlet Insulate' (Step 2). Secure VENT Insulate with 2 x 8in wire ties and cut excess (Step 3-4)



Connecting SOTER™ Condenser Drain Tubing

The 3' length of clear Tygon 'Condenser Drain Tubing' should be placed onto the condenser's drain hose barb. The clear hose will allow you to visually see the alcohol draining into your waste alcohol collection container or solvent drain.

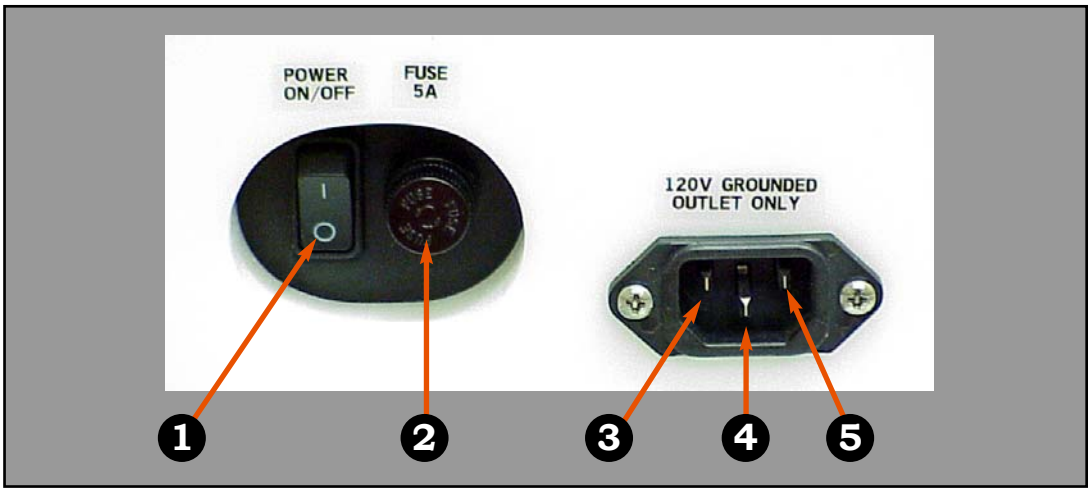
NOTE:
The drain tubing may be routed to either a waste alcohol collection container or solvent drain, as per your facility guidelines. Drain valve may be left open during process run if drain tubing routed to proper collection system.



Automegasamdri®-915B, Series B Power Panel

1. **ON / OFF SWITCH**
2. **5 AMP SLO-BLOW FUSE**
3. **AC (WHITE) NEUTRAL**
4. **GROUND (GREEN) 120AC/50-60HZ (test your ground**
5. **AC (BLACK) HOT**

Locate the Power ON (1) / OFF (0) socket switch on the right hand side panel of the 915B (near 5A fuse) make certain it is in the OFF (0) position (down).



Plugging Power of Automegasamdri®-915B, Series B

NOTE:
In winter months it may be beneficial to use a small heater (ceramic type only) near the base of the LCO_2 tank to ensure proper flow of liquid CO_2 (See illustration on p.3). LCO_2 tank temperature should be between 65º-75ºF. Low tank temperature (due to external tank storage during winter months) will result in lower tank pressure.

Surge Protector

The Surge Protector switch is used to protect both the SOTER™ Condenser and the Automegasamdri®-915B from any voltage surges.

- Plug the Surge Protector power strip into a 120V properly grounded outlet.
- Plug both the 915B and SOTER™ Condenser into Surge Protector power strip.

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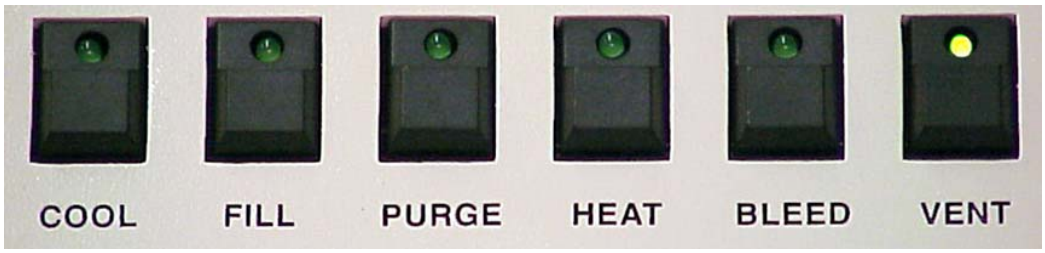
CHAPTER 3

Operating Automegasamdri®-915B, Series B

3

1. Turn power switch “ON”. “ON/OFF” power switch is located on right side panel (See p.10). Green LED on VENT button will illuminate. This indicates the power is ON and the unit is in standing by in the VENT mode.



VENT MODE

2. Let 915B stand for 3-5 minutes. This initial wait period will allow all internally heated plumbing components to “warm-up”.

3. Open process chamber by carefully lifting Chamber Lid and placing aside onto soft surface (Lint free wipes provide a convenient surface to place chamber lid).

4. Now, press the VENT button once. The VENT LED will begin to blink. This indicates that the VENT solenoid is closed and in the “STAND-BY” mode. You may now introduce ultra-pure alcohol into the chamber.

5. At this point, fill the process chamber with enough high purity alcohol (I.P.A., Methanol, or Ethanol) to cover your wafer(s) or die.

NEVER EXPOSE CHAMBER TO ANY ACIDS!

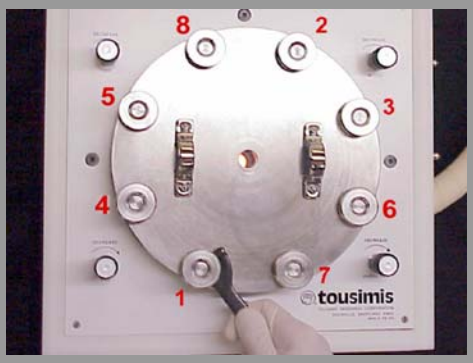
6. Carefully and quickly transfer your wafer(s) from your wafer container into the 915B process chamber. For best results, minimize any exposure time to air.

7. Carefully align and place the chamber lid on top of the chamber.

Star-Pattern Tightening Sequence

NOTE:
A "Star-Pattern" is the sequence necessary to properly secure chamber lid prior to initiating a process run

Use your hand to evenly tighten the 8-knurl nuts around the circumference of the chamber lid. Then, use the spanning wrench provided, uniformly tighten each knurl nut in a "Star Pattern". Tighten the knurl nuts in the numbered sequence as shown in the photo in previous page. Repeat this rotation "Star Pattern" sequence until the knurl nuts are unable to tighten further.



Begin gradual tightening of knurl nuts with spanning wrench at starting position #1

8. Once the chamber lid is secured, it is time to set the PURGE timer located to the right of the push button switches (See p.16). Positions on the purge timer are calibrated at 5-minute intervals.

Setting Purge Timer

Setting the "purge timer" indicator arrow to the #1 position will give you a 5-minute purge time. The #2 position will give you a 10-minute purge time… Correspondingly, the #9 position will give you the maximum purge time capable of 45 minutes.

The "Purge Time" setting is best determined by the individual process engineer. General Purge Time guidelines for various chamber alcohol levels are the following:

- ¼ chamber = 10 minute purge time.
- ½ chamber = 15 minute purge time
- ¾ chamber = 20 minute purge time

NOTE:
Actual purge time can vary greatly depending on your sample type in combination with the FILL and PURGE metering value adjust positions.

STEP 1

STEP 2

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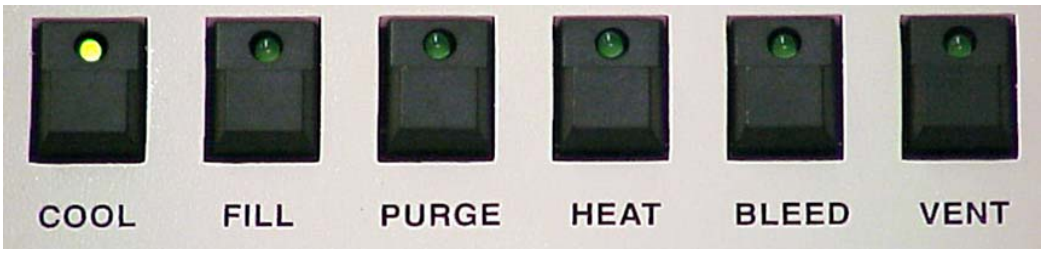
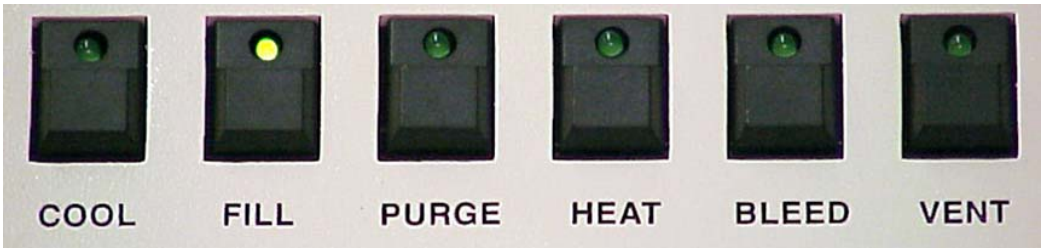
9. After initial warm up, press the COOL button. The COOL LED light will go on, and the VENT light will turn off. The chamber will begin to COOL. As the chamber temperature slowly begins to drop, you may hear LCO_2 circulating through the unit. The 915B will automatically continue cooling until the chamber temperature reaches 0°C (±5°C). At this point, the cooling will automatically stop.



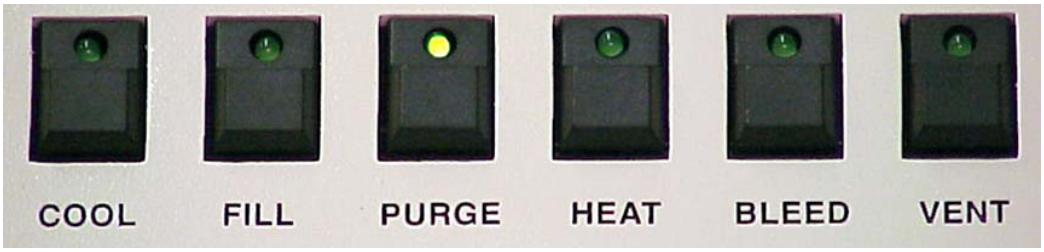
COOL MODE

10. Press the FILL button and the 915B will begin to fill the process chamber with LCO_2. **From this point forward, the Automegasamdri®-915B, Series B will automatically advance through all process modes sequentially until completion.** During the FILL mode, the LCO_2 will enter and fill the chamber for 8 minutes. You may hear the COOL cycle ON/OFF during the FILL mode as the chamber temperature is automatically maintained below 10°C.



FILL MODE

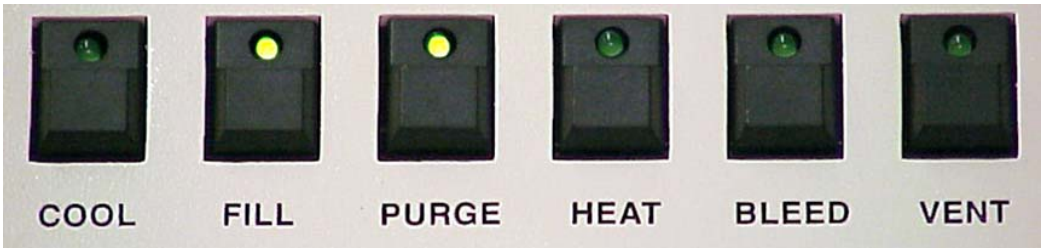
11. After the 8 minute FILL mode expires, the 915B will automatically advance into the PURGE mode. This will be indicated by the illumination of the PURGE LED.



PURGE MODE

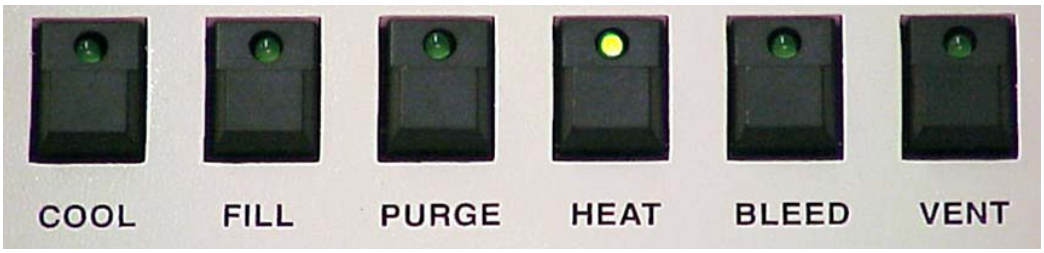
12. At this point of the cycle, the 915B will remain in the PURGE mode for the duration of the Purge time pre-set by the operator via the PURGE TIMER (See p.16). The waste alcohol exiting the 915B Chamber Exhaust connect hose will be routed directly into the SOTER™ Condenser. The exiting solid CO_2 collected into the SOTER™ Condenser will sublime into CO_2 gas and exit via SOTER™ Condenser VENT outlet into facility exhaust conduit.

13. Upon Completion of the PURGE mode, the 915B automatically advances into the POST-PURGE-FILL mode in which the process chamber fills with LCO_2 for an additional 4 minutes. This mode is visualized by both the FILL and PURGE LED's illumination.



POST-PURGE-FILL MODE

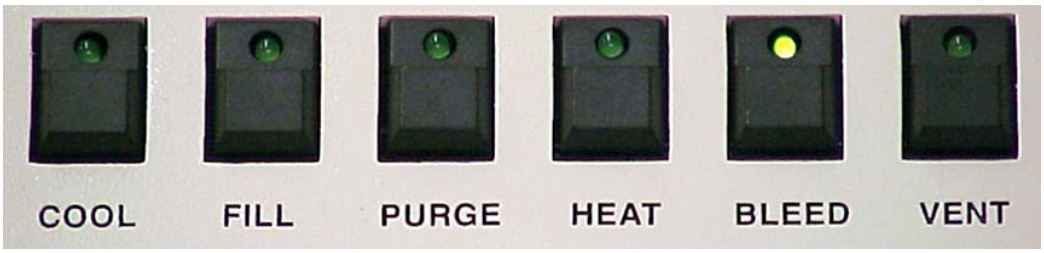
14. Upon completion of the POST-PURGE-FILL mode, the PURGE and FILL LEDs will turn off and the HEAT LED will illuminate. The HEAT mode is the stage in which the samples are carried through the ***"Critical Point"***. Both the pressure and temperature will steadily rise. (Consult Check-Out Data Sheet in the appendix of this 915B User Manual)



HEAT MODE

'**tousimis equilibrium**' is the point during the critical point passage in which both the pressure and temperature are maintained above the critical point within the chamber for a period of 4 minutes prior to advancing into the BLEED mode.

15. When the chamber pressure reaches and goes beyond 1072 psi, it will stabilize in the range of 1350 psi (± 5%). As the temperature achieves 31°C, the unit has achieved the "critical point" and this is where the 'tousimis equilibrium*' cycle starts. The HEAT LED will begin to blink for the next four minutes indicating your 915B is in 'tousimis equilibrium.



BLEED MODE

* SCFH = Square Cubic Feet per Hour

16. At the end of the 'tousimis equilibrium' period, the 915B will automatically advance into the BLEED mode. The HEAT LED will stop blinking and the BLEED LED will illuminate.

17. At this point, you can measure the BLEED rate (if desired) via the 100 SCFH* Flow Meter supplied, by attaching the Flow Meter to the outlet of the COOL/BLEED CO_2 Exhaust. The BLEED rate has been factory pre-set to decompress the chamber at a rate of approximately 100-150psi/min.

The flow rate should read 85-90 SCFH at the onset of the BLEED cycle. This setting should yield an average of approximately 100-150psi/min reduction in pressure. This pressure reduction flow rate is the desired decompression rate between 1300psi to 480psi.

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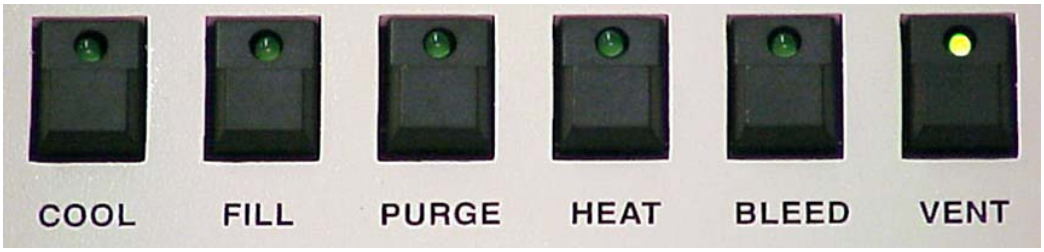
18. At approximately 380-480 psi, the 915B will automatically advance from BLEED mode to the VENT mode. The BLEED LED will turn off, while the VENT LED will illuminate.



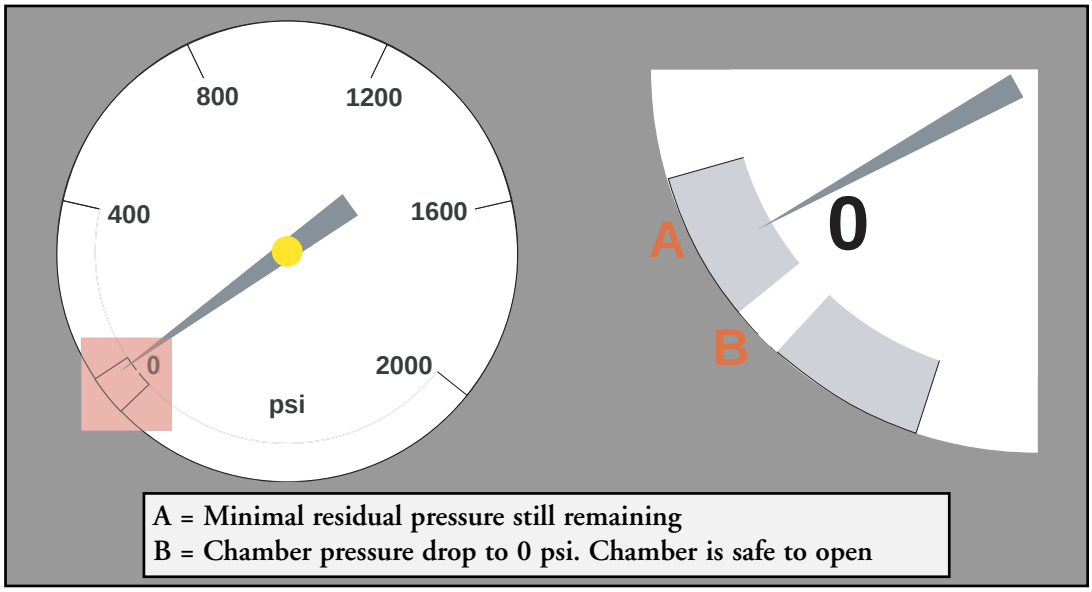
VENT MODE

19. It is not necessary to readjust the PURGE-VENT metering valve flow rate. The chamber should then come to atmospheric pressure in approximately 5 minutes in this VENT mode.

20. At this point, the chamber lid may be removed by alternatively and evenly loosening all of the knurl nuts using the spanning wrench in a "Reverse Star Pattern".

(Pressure Gauge should be in the 0 psi range, Never attempt to 'force' opening)

Pressure Gauge (0 psi)



21. The wafer(s) or chip(s) can then be removed from the chamber for further processing. Seal the chamber with the lid to help keep it clean and moisture free.

22. Turn the 915B power off using the ON/OFF SWITCH located on the right-hand side of the tool (See p.10). You will notice that it will take a few seconds for the VENT LED to turn off.

23. Turn the power strip power switch into the OFF position when finished processing your samples. This will shut down the power to both the SOTER™ Condenser and the 915B.

CHAPTER 4

Illustrations

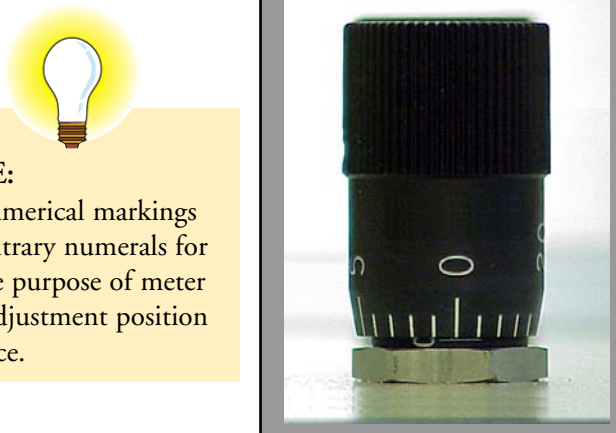
4

Purge Timer Overview

PURGE Timer:
#1 … 5 min
#2 … 10 min
#3 … 15 min
etc. to 45 min at the #9 position.

Each position refers to a 5-minute increment.

Metering Valve w/ Vernier Handle Setting Example



NOTE:
The numerical markings are arbitrary numerals for the sole purpose of meter valve adjustment position reference.

0.00 Setting

0.50 Setting

1.00 Setting

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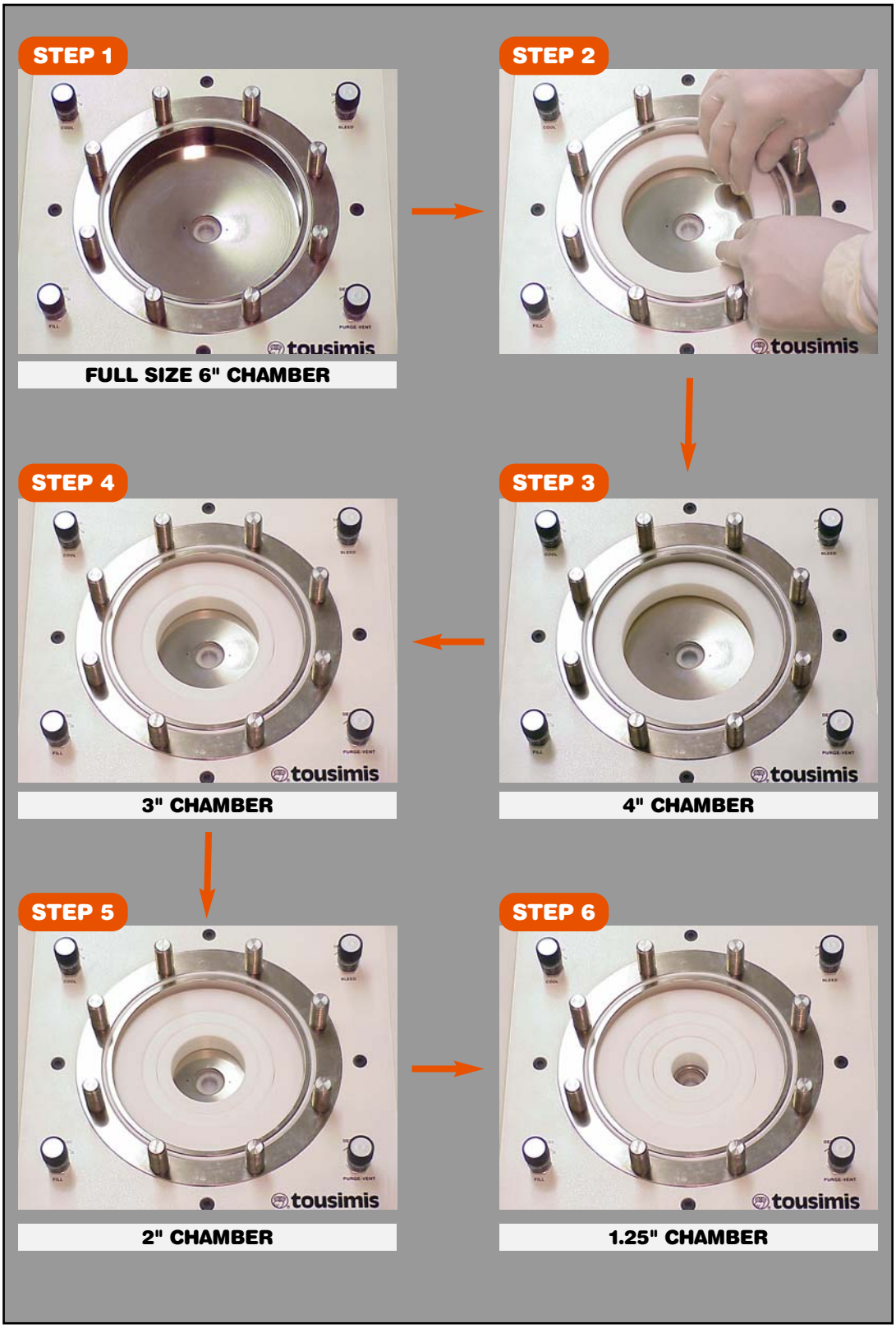
Chamber Inserts

NOTE:
The chamber inserts provide wafer size process flexibility. They also hold the wafer(s) or chip(s) in place during the process run.



CHAPTER 5

Maintenance and Support

5

Regular Maintenance Schedule

Maintenance Activity	Recommended Frequency	Manual Reference	trc® Catalog Number
Keep Chamber Clean and Dry	Always	p. 19	N/A
Replace LCO_2 Tank	After 50% net tank consumption	p. 23 (FAQ)	Contact local supplier
Replace LCO_2 Oil/Water Filter on LCO_2 Filter Assembly	500lb LCO_2 Use	p. 20-21	# 8784A
Replace T-Filter Element on LCO_2 Filter Assembly	1 Year*	p. 22	# 8770-83B
Chamber O-Ring	3 Months*	p. 29-31	# 8770-51T/915B
External Purge Line 0.5µm Filter	6 Months*	p. 38-40	# 8770-83B
* Depends on usage.			

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Chamber Care

NOTE:
* Use Ultrapure Alcohols only! (i.e. I.P.A., Methanol, Ethanol).

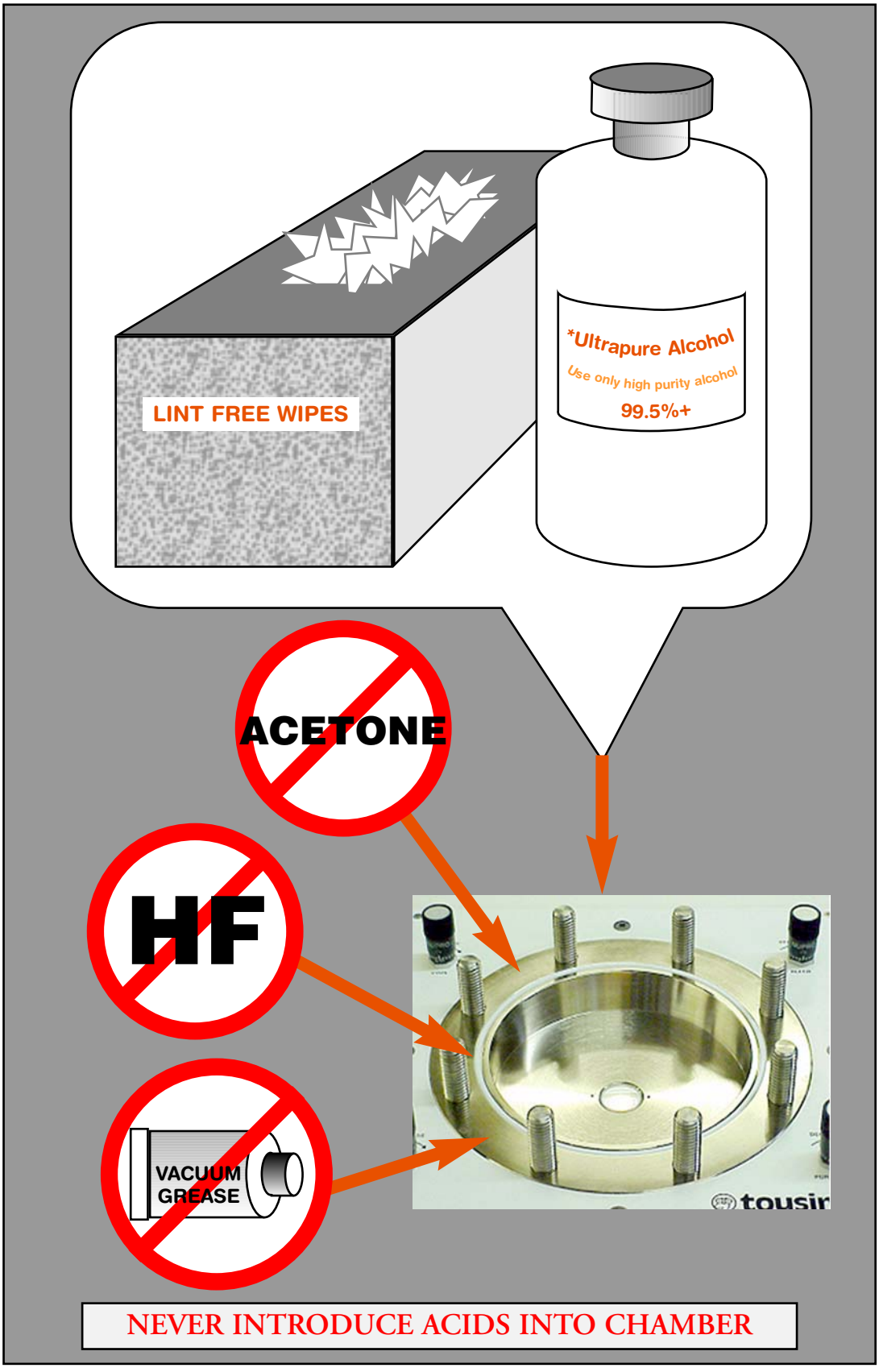
Use minimum 99.5% purity Alcohols for best results.

NOTE:
Do not expose chamber to HF or any other Acids.

Do not use Acetone.

Please consult tousimis before using any non-recommended intermediate fluids or process any non-traditional CPD application material(s)

NOTE:
BE SURE TO KEEP CHAMBER O-RING GROVE AND FACE CLEAN AND DRY AT ALL TIMES.



LCO_2 Filter Assembly

THE tousimis® LCO_2 FILTER ASSEMBLY (# 8784)

(❹ + ❺ Figure Shown Below)

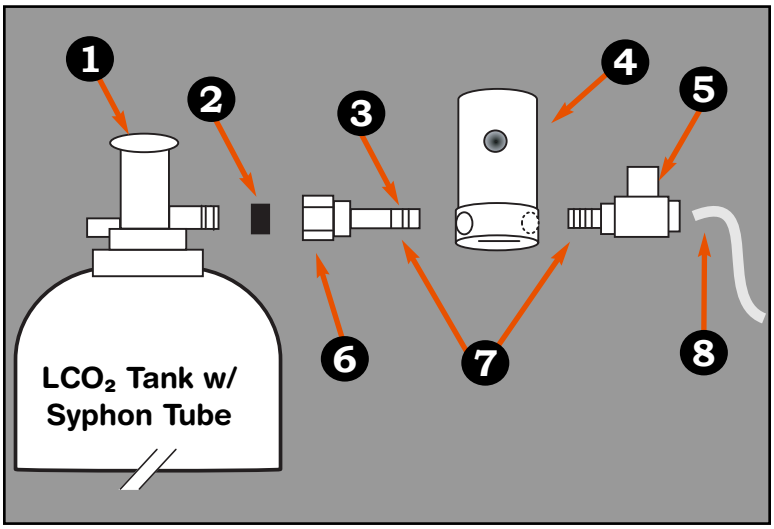
Installation Instructions

1. Uncouple CGA-320 S.S. nut from LCO_2 tank. Close main tank valve. Crack S.S. nut and bleed line pressure. Make certain there is no pressure within the high pressure hose.

2. Install filter element as shown in the diagram. (#8784A) Push element steadily into upper housing orifice until slight resistance is felt. Screw housing (Part B) onto upper housing (Part A). Be sure that teflon® O-Ring is in place.

3. The 0.5 µm T-Filter Element (# 8770-83B) is pre-installed into T-Filter.

* Change LCO_2 Filter Element (#8784A) with every 500 lbs of LCO_2 consumption, change T-Filter Element (#8770-83B) every 1 year to insure proper filtration.



❶ Main LCO_2 Tank Valve

❷ Gasket (Teflon® or Nylon)

❸ CGA - 320 S.S. Nipple

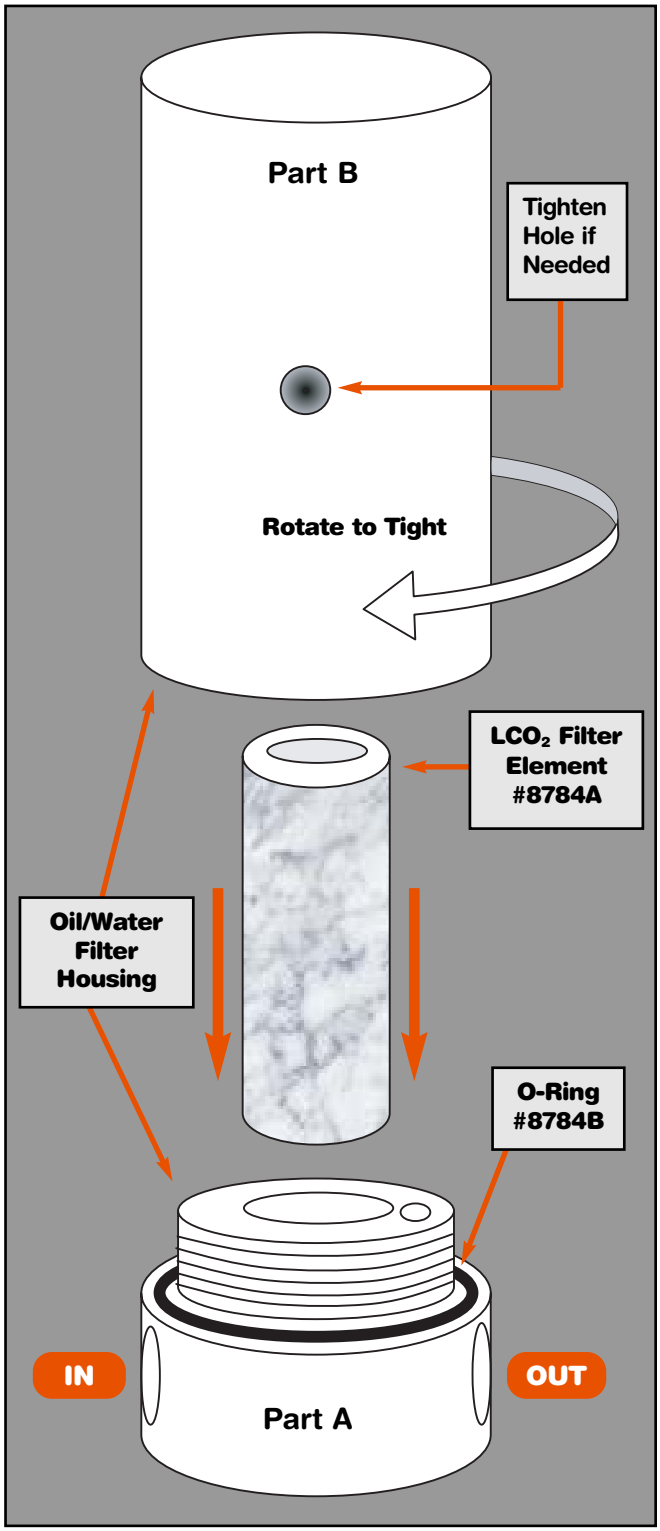
❹ Oil/Water Filter Housing w/ LCO_2 Filter Element (#8784A)

❺ T-Filter with T-Filter Element (0.5 µm, #8770-83B)

❻ CGA - 320 S.S. Coupler Nut

❼ Teflon® tape

❽ High Pressure Hose to Samdri®



CAUTION: USE tousimis® LCO_2 FILTER ELEMENT (trc# 8784A) ONLY.
Operating pressure not to exceed 1000 psi

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LCO_2 Filter Element Installation (#8784A)

STEP 1

After all of the pressure is safely bled from high pressure line, unscrew Oil/Water Filter Housing by hand.

STEP 2

Remove Oil/Water Filter Housing.

STEP 3

Position LCO_2 Filter Element (#8784A) into center of lower Oil/Water Filter Housing.

STEP 4

Place new LCO_2 Filter Element (#8784A) into lower Oil/Water Filter Housing. Let gravity hold element in place.

STEP 5

Carefully lower Oil/Water Filter Housing over replacement element (#8784A).

STEP 6

Hand tighten the housing body together firmly. O-Ring seats properly. Open main tank valve and check for leaks.

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LCO_2 T-Filter Element Installation (#8770-83B)

STEP 1

After all of the pressure is safely bled from high pressure line, unscrew T-Filter cap using wrench.

STEP 2

Carefully remove T-filter element.

STEP 3

Install a new T-filter element (#8770-83B) into center of T-filter housing.

STEP 4

Top view of correctly installed T-Filter.

STEP 5

Hand tighten T-filter cap.

STEP 6

Use wrench to tighten the T-filter cap firmly. Open LCO_2 tank valve and check for leaks.

NOTE:
Do not over-tighten T-Filter Cap.

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FAQ

Are the Metering Valves pre-set from the factory?

YES. All Metering Valves (See p.16) are factory set during the final check-out. However, should you wish to change the rate of flow, feel free to readjust the valves to suit your particular parameters. Keep in mind that the incoming LCO_2 into the chamber controlled by the FILL adjust; should always be greater than the outlet of LCO_2 (controlled by the PURGE / VENT adjust) during the PURGE mode.

The BLEED rate needs to average no more than 100-150 psi/minute in chamber pressure reduction. A Flow Meter has been provided for occasional BLEED rate adjustment.

Do I need to open / close the Metering Valves?

NO. There is no need to "Close" or "Open" the Metering Valves. These functions are carried out by the Internal Solenoid Valves. The Metering Valves are only for adjusting the Flow Rate of LCO_2 or gaseous CO_2.

Should the LCO_2 tanks be secured?

YES. It is recommended that:

The LCO_2 Tanks be placed onto LCO_2 Tank Scales (trc #8770-54) and secured as per your facility safety regulations. Monitor the net LCO_2 used. When you approach 50% LCO_2 consumption, it is recommended that you replace the LCO_2 tank with a new one. Always keep several spare tanks of LCO_2 in reserve.

Do I need an In-line regulator between the tank and the 915B?

NO. A regulator is not needed between the LCO_2 tank and the 915B. The 915B is designed to simply operate from LCO_2 direct tank pressure.

Is the chamber heated during BLEED?

YES. During the BLEED cycle as well as the VENT cycle, the 915B will maintain the chamber temperature automatically above 31°C.

How do I replace the #8784A filter elements?

To replace #8784A filter element, loosen and remove lower part B by turning counter clockwise. Remove old element and replace with new (See illustration p.17-18).

How do I secure the chamber lid?

Hand-tighten the chamber lid with the 8 Knurled Nuts supplied using the "Spanning Wrench". Use even and steady pressure on all Knurl Nuts alternatively. Never use a non compatible tool or excessive force.

What should I do if a leak occurs during the FILL mode from the chamber lid?

Please reference appendix section "Automegasamdri®-915B, Series B Leak Correction Protocol".

Should I use "High-Pressure Head" tanks such as Helium or other high-pressure gases?

NO. Never use high-pressure tanks. Typical proper pressure range for LCO_2 tanks are between 750 – 900 psi. Higher pressures may damage Automegasamdri®-915B, Series B and / or cause failures.

Can I use lower purity alcohol or acid in chamber?

NO. only use ultrapure alcohol (ethanol, methanol, I.P.A., etc.) in chamber.
NEVER ANY ACID!
Contact tousimis® prior to using any other intermediate liquids.

What should I do if all the LED's begin to blink during a process run?

This indicates a CRITICAL POINT PASSAGE FAILURE due to either non-sufficient temperature or pressure. Typically this results from LCO_2 running out mid process. Turn "Chamber Power" OFF. Replace empty LCO_2 cylinder with a new tank, turn "Chamber Power" back ON and initiate new run as per normal.

Why can I only use 50% of the net amount of LCO_2 and not 100% of the net LCO_2 within a new LCO_2 tank?

LCO_2 is lost during the process for 2 reasons:

1) As the liquid level drops in the LCO_2 tank, the gaseous head space created as the liquid level drops is taken up via gaseous CO_2 molecules.
2) Siphon (aka: dip-tubes) does not reach the absolute bottom of the LCO_2 tank.

What should I do if the initial COOL time is suddenly much slower than normal?

The majority of the time, the reason is lack of Liquid CO_2. The SAMDRI® is designed to COOL the process chamber via Liquid CO_2 and not gaseous CO_2.
Reasons that typically explain gaseous CO_2 delivery:
1) The Liquid CO_2 level has dropped below LCO_2 tank siphon (aka: dip tube) and only gaseous CO_2 is being delivered. [Note: The best way to monitor LCO_2 is via weight and not pressure. It is best to monitor tank weight via a "*LCO_2 tank scale (trc#8770-54)*"]

2) Gas supplier has delivered Gaseous rather than Liquid CO_2 by mistake. This can happen as the 2 tank types may look identical and the delivery/loading Gas Company staff accidentally delivered the wrong tank type to your site.

The simple solution is to replace the existing LCO_2 supply tank with a new LCO_2 tank and initiate COOL mode. If the same problem persists; please contact customer service at tel. #301-881-2450 or via email at techsupport@tousimis.com.

How frequently should the LCO_2 filter Element (trc# 8784A) be replaced?

The Filter Element #8784A should be replaced with every 500lbs (230kg) of LCO_2 consumption

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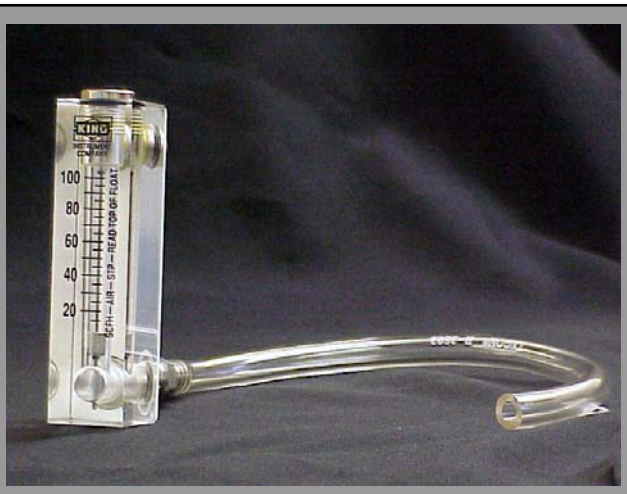
What can I do to check that the BLEED rate is properly set should it appear unusually slow?

The flow rate should read 85-90 SCFH at the onset of the BLEED cycle. This setting should yield at average of approximately 100-150 psi/min reduction in pressure. This pressure reduction flow rate is the desired decompression rate between 1300 → 480 psi to avoid condensation.

You may periodically measure the BLEED rate (if desired) via the Flow Meter supplied by attaching the Flow Meter to the CO_2 exhaust outlet via a short (approximately 2') piece of Tygon tubing.

Flow Meter



100 SCFH Flow Meter with 2ft tygon® tubing

The Flow Meter is provided to periodically check BLEED onset flow rate. This rate should be 85-90 SCFH at onset of BLEED mode immediately after 'tousimis equilibrium' period.

This does not have to be measured with each process run. The 915B has had the BLEED rate adjusted during final check-out prior to shipment. Periodic BLEED rate adjustment necessary only if either faster or slower than normal BLEED rate suspected by operator.

Consult tousimis® at tel #301-881-2450 or via email at **techsupport@tousimis.com** with any questions.

How much LCO_2 will be consumed during a typically process run?

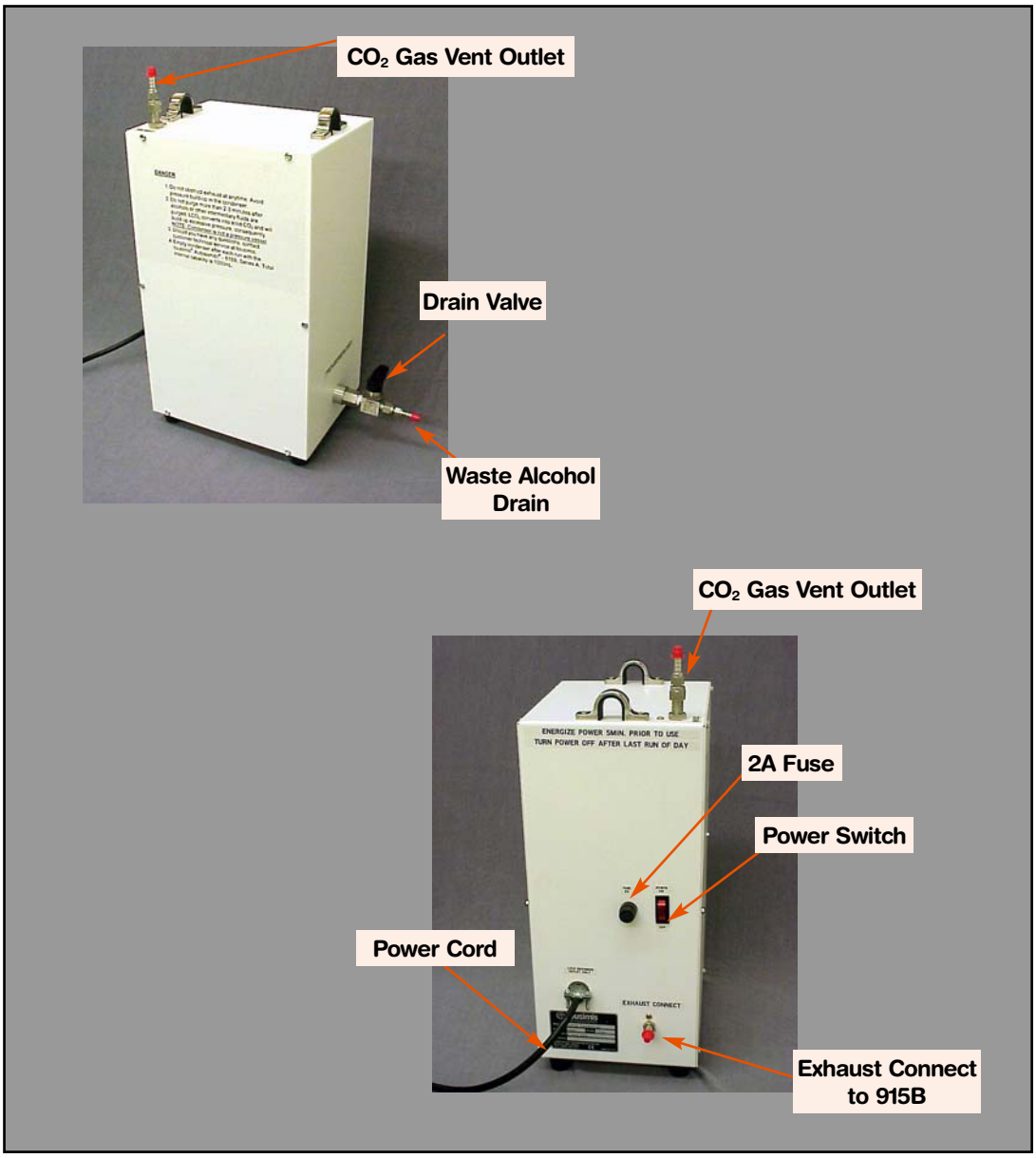
The LCO_2 consumption will vary depending upon the PURGE Time setting. You should be able to use either Pos#2 (10min) or Pos# 3 (15min) on the PURGE Timer for most sample processing. The typical consumption rate to PURGE - 150ml of alcohol at PURGE Timer Position #2 (10 min) would be the following:

COOL LCO_2 Consumption ~ 3.5lbs (1.6kg) / process run
CHAMBER LCO_2 Consumption ~ 4.0lbs (1.8kg) / process run

What is the purpose of the SOTER™ Condenser?

A. The SOTER™ Condenser quietly captures and separates the exiting waste Alcohol and CO_2 from the process chamber. The SOTER™ Condenser vents CO_2 gas via the VENT OUTLET. This is ideally routed into your facility exhaust conduit. The waste alcohol is routed out of the SOTER™ Condenser's drain valve into either a waste alcohol collection container or a solvent drain.

SOTER™ Condenser



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OPTIONAL ACCESSORIES

Catalog #	Description
8760-02	Knurl Nut for Automegasamdri®-915B
8760-40	5 AMP Fuse
8770-10	Lamp, 120/60Hz volt
8770-32	High Pressure Hose, 5 ft
8770-33	High Pressure Hose, 10 ft
8770-HPS	High Pressure Hose, Custom Length Up To 10m (33ft)
8784	LCO_2 Filter Housing for 8784A Filter Element
8784A	Replacement LCO_2 Filter Element for 8784 Filter Housing
8784B	O-Ring for 8784 Filter Housing Seal
8784-05	Gasket for LCO_2 Tank Connect
8783	LCO_2 Filter Adapter Kit
8770-51T/915B	Teflon® O-Ring for Automegasamdri®-915B
8770-53	Power Cable, three prong, 120V/60Hz
8770-54	LCO_2 Tank Scale, w/ Remote LCD Display (400lb capacity)
8770-55	LCO_2 Tank Heater
8770-56	Step-Down Transformer, 220V → 110V
8770-57	Step-Up Transformer, 100V → 120V
8770-70	Chamber Lid for tousimis Automegasamdri®-915B, Series B
8770-83A	Internal 0.5µm 316SS Particulate Line Filter
8770-83B	0.5µm Particulate Filter Element for LCO_2 T-Filter or External Purge Line Filter
8768A	HF Compatible Wafer Holder for 6” Diameter Wafers
8768F	HF Compatible Wafer Holder for 5” Diameter Wafers
8768B	HF Compatible Wafer Holder for 4” Diameter Wafers
8768C	HF Compatible Wafer Holder for 3” Diameter Wafers
8768D	HF Compatible Wafer Holder for 2” Diameter Wafers
8768G	HF Compatible Wafer Holder for 1” Diameter Wafers
8768E	HF Compatible Chip Holder for 5 x 10mm Square Die

Contact tousimis at tel.# 301-881-2450 or trc@tousimis.com for current pricing and availability.

WARRANTY

The Automegasamdri®-915B, Series B is warranted to the original purchaser for two years from date of purchase against any defect in materials or workmanship. Should you have any questions, please feel free to contact us. If it is determined that the unit should be returned for repairs to our Service Department, we will send a written authorization for shipment. Parts and labor are free of charge; shipping charges are to be paid by customer (insure instrument at current list price).
DO NOT ship instrument via U.S. Mail. Use UPS, FedEx or other qualified shippers only.

Our mailing address: **tousimis research corporation**
2211 Lewis Avenue
Rockville, Maryland 20851
USA

Our shipping address: **tousimis research corporation**
Attention: Instrument Service Department
2211 Lewis Avenue
Rockville, Maryland 20851
USA

Telephone # 301-881-2450 Fax #301-881-5374 Email: techsupport@tousimis.com

REPACKAGING FOR SHIPMENT

After authorization for repairs is received (see warranty), this general rule may be followed in repackaging a tousimis® instrument for shipment:

a) Attach identification tag to instrument. Tag should indicate owner name, the model and 4-digit serial number of the instrument, and the type of the service or repair desired.

b) Secure chamber lid over a properly seated O-ring and tighten 8-knurl nuts evenly. Do not send the high-pressure hose or electrical power cord.

c) Place instrument in original container, if available. If original container and packaging material is not available, new packaging may be purchased from tousimis

If original container is not used,

d) Wrap the instrument in bubble plastic.

e) Protect panel faces and instrument sides with foam or appropriate non-abrasive cushioning material. Use sufficient shock-absorbing packing material around all sides of the instrument. A minimum of two double walled boxes are required for shipment; BOX-WITHIN-A-BOX AT 350LBS. TEST STRENGTH.

f) Use heavy duty shipping tape or metal bands to seal container.

g) Mark shipping container with "Delicate Instrument, Fragile", etc. and insure it.

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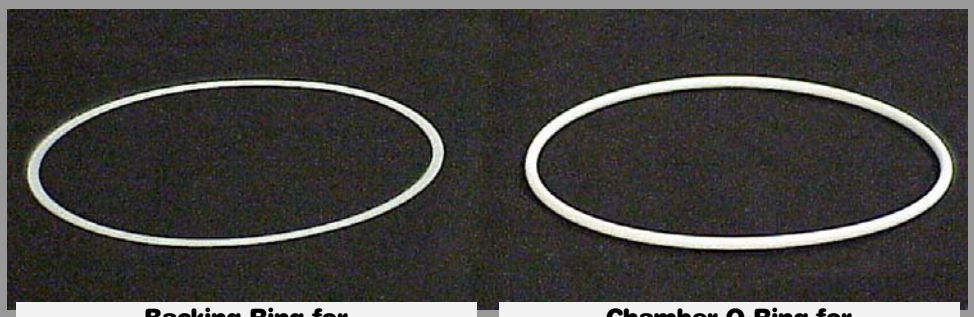
APPENDIX A

Backing Ring and Chamber O-Ring Installation

A

Backing Ring and Chamber O-Ring Overview



Backing Ring for Automegasamdri®-915B, Series B
Cat.# 8770-51T/915B-BR

Chamber O-Ring for Automegasamdri®-915B, Series B
Cat.# 8770-51T/915B

Chamber Seal Installation

STEP 1

Automegasamdri®-915B Chamber with no seals.

STEP 2

Install Backing Ring into the Automegasamdri®-915B chamber gland.

Chamber Seal Installation

STEP 3

Automegasamdri®-915B Chamber with Backing Ring.

STEP 4

Next, carefully install a new Chamber O-Ring on top of the Backing Ring.

STEP 5

Automegasamdri®-915B Chamber with O-Ring installed on top of Backing Ring.

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Chamber Seal Removal

NOTE:
* DO NOT DISCARD BACKING RING

STEP 1

Lift O-Ring and Backing Ring from the chamber gland using a razor blade edge. Be careful to prevent any scratching of metal chamber surface with razor blade.

STEP 2

Carefully lift both Rings from the chamber gland.

STEP 3

Completely remove Backing Ring and O-Ring from the Automegasamdri®-915B chamber.

STEP 4

Separate Backing Ring from O-Ring. The Backing Ring is reusable*. Only O-Ring needs to be replaced.

STEP 5

Re-Install Backing Ring into Automegasamdri®-915B chamber gland.

STEP 6

Install a new O-Ring into the Automegasamdri®-915B chamber gland on top of Backing Ring.

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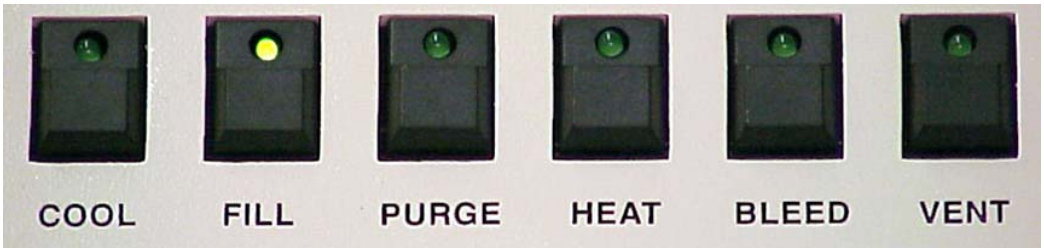
APPENDIX B

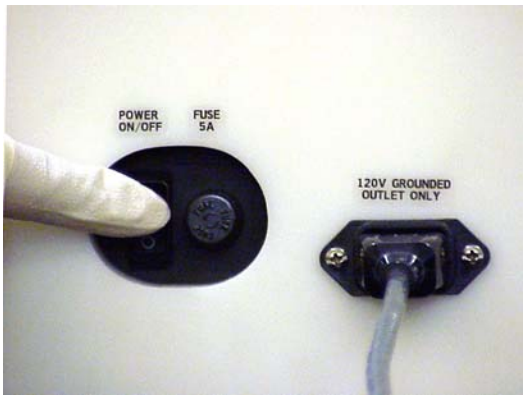
Leak Correction Protocol

B

1. If a leak is detected during initial FILL mode; it will typically be noticed between the 400-600 psi range.



2. Turn OFF the Power Switch located on right hand side of Automegasamdri®-915B. This will isolate the chamber from any liquids coming in or out by immediately closing all solenoid.



3. Wait 15 seconds and then simultaneously push BLEED switch while turning Power Switch "ON" as shown below. This is how the Automegasamdri®-915B can be placed into a "Manual Mode" of operation.

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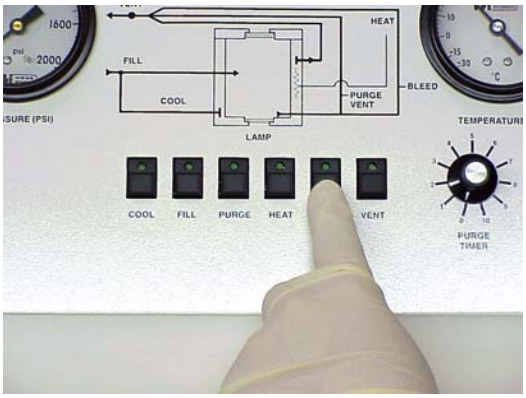
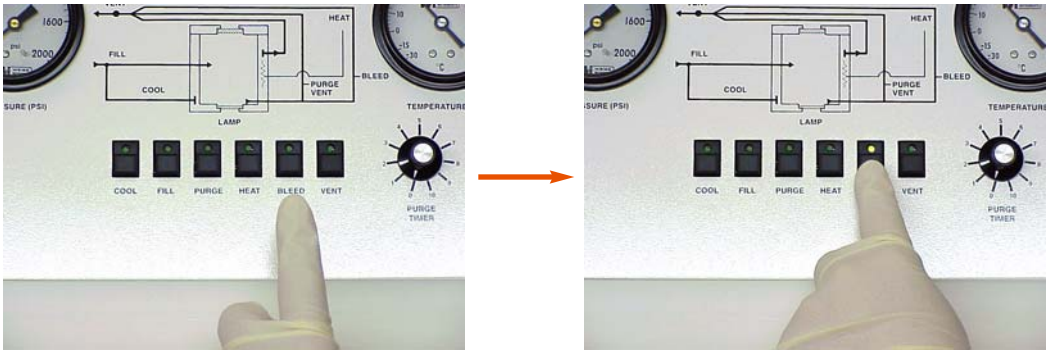
4. Hold finger on BLEED switch for 15 seconds.

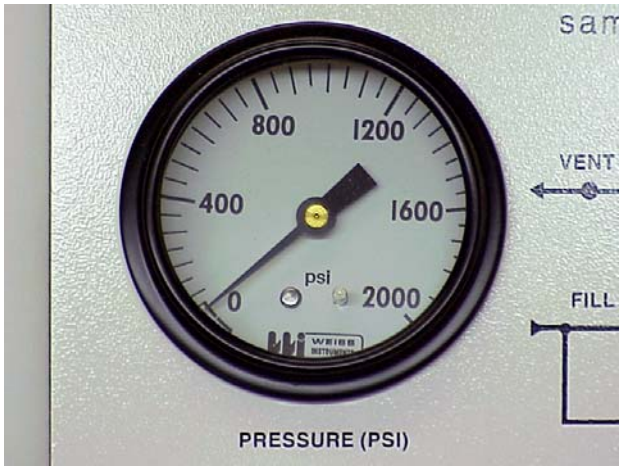


5. Release the BLEED switch and press again.
BLEED switch LED will go ON



6. Now the Automegasamdri®-915B is in the "Manual Mode". Open the BLEED meter valve to accelerate the decrease in chamber pressure to "0 psi" (See illustration p.15). This decreases the wait prior to opening the chamber lid.

BLEED Meter Valve



0 psi

7. Carefully remove the chamber lid from Automegasamdri®-915B. It is normal to see little bubbles in the intermediate fluid (i.e.: I.P.A., methanol). This is due to carbonization.

8. Carefully replace chamber o-ring as shown below (Step #1 – Step #6).

Replacing Chamber O-Ring

Lift O-Ring and Backing Ring from the chamber gland using a razor blade edge. Be careful to prevent any scratching of metal chamber surface with razor blade.

Carefully lift both Rings from the chamber gland.

Completely remove Backing Ring and O-Ring from the Automegasamdri®-915B chamber.

Separate Backing Ring from O-Ring. The Backing Ring is reusable*. Only O-Ring needs to be replaced.

NOTE:
* DO NOT DISCARD BACKING RING

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Replacing Chamber O-Ring

Thoroughly dry all chamber surfaces and gland prior to installing a new chamber o-ring.

1. Gland
2. Face Surface

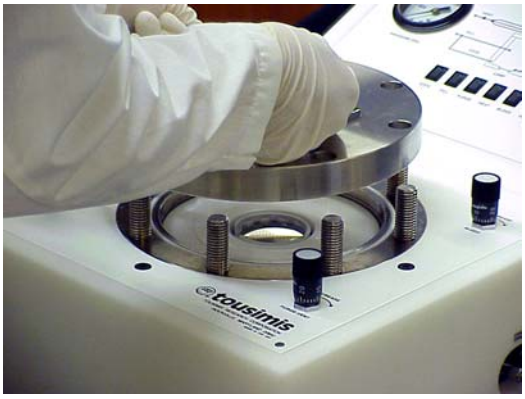
STEP 5

Re-Install Backing Ring into Automegasamdri®-915B chamber gland.

STEP 6

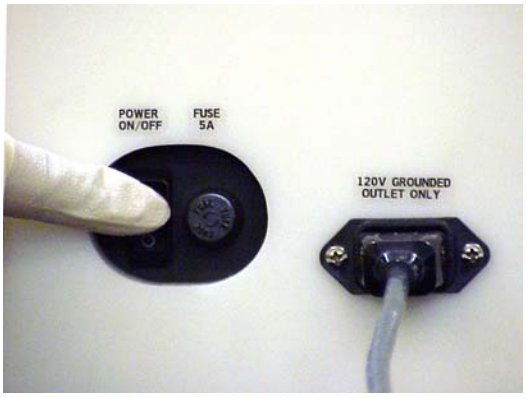
Install a new O-Ring into the Automegasamdri®-915B chamber gland on top of Backing Ring.

9. Close chamber lid to the Automegasamdri®-915B and secure it as per normal.

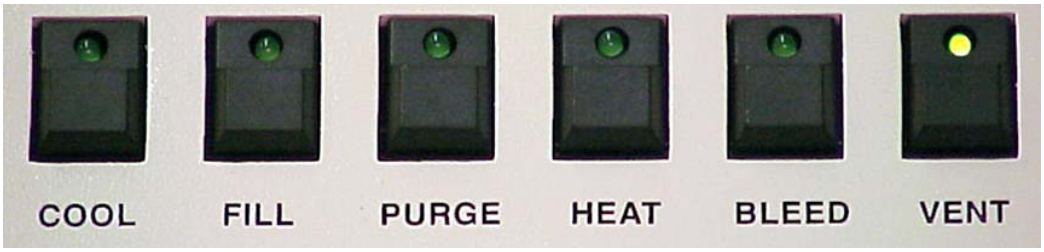


10. Turn Power Switch “OFF”. This will take the Automegasamdri®-915B back out of the “Manual Mode”.

11. Wait 15 seconds prior to turning Power Switch back “ON”. This will power the Automegasamdri®-915B back up into the normal “Auto Mode” of operation.



12. The VENT switch LED will illuminate.



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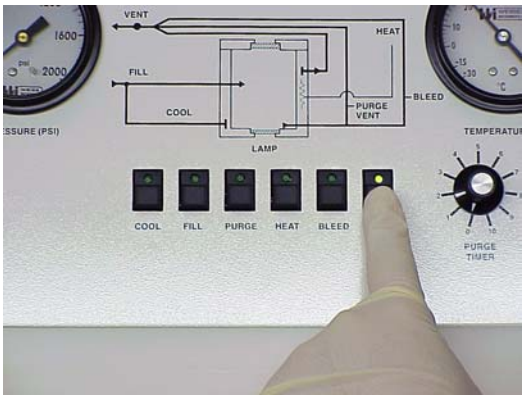
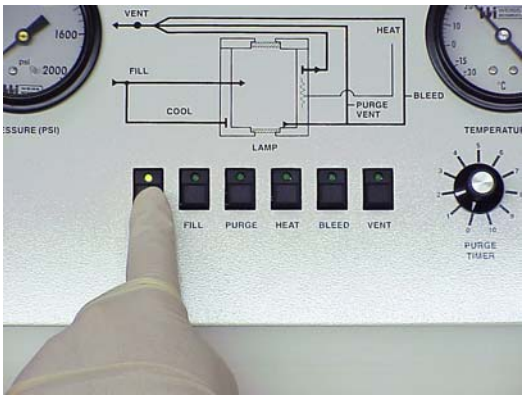
13. Press the VENT switch once as soon as the VENT LED is illuminates when the power is turned ON. This will initiate the VENT LED to blink, ON and OFF. This is the "Standby Mode" prior to initiating a run.



14. Prior to initiating another process run, remember to reset the BLEED metering valve to its original Pre-Set position. Reference Checkout Data Sheet BLEED Meter valve setting.

15. Press the COOL Switch to initiate another process run. Operate as per nominal from this point forward.

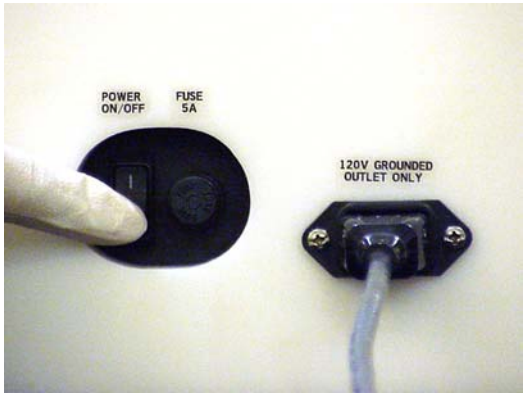


APPENDIX C

Purge Line Filter Maintenance

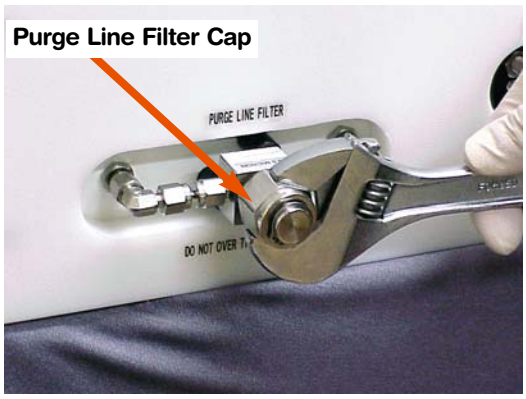
NOTE:
The Purge Line Filter may fill with downstream MEMS device debris from the process chamber. It is recommended to replace filter element with a new one every 3-6 months depending on usage.

1. Turn the power switch "OFF" and unplug 120V power cord from the Automegasamdri®-915B.



2. Locate the External Purge Line Filter on the right side of the Automegasamdri®-915B.

3. Using an adjustable wrench, carefully un-tighten the Purge Line Filter Cap. Upon loosing Cap, unscrew with your hand to remove.



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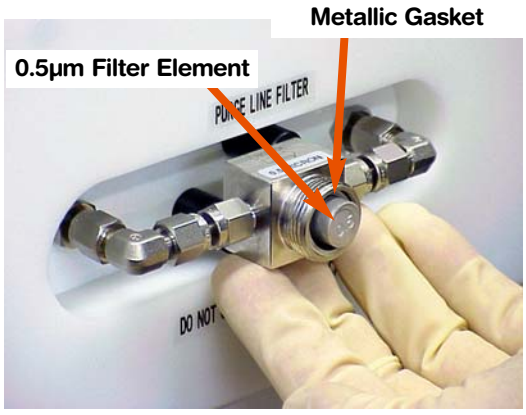
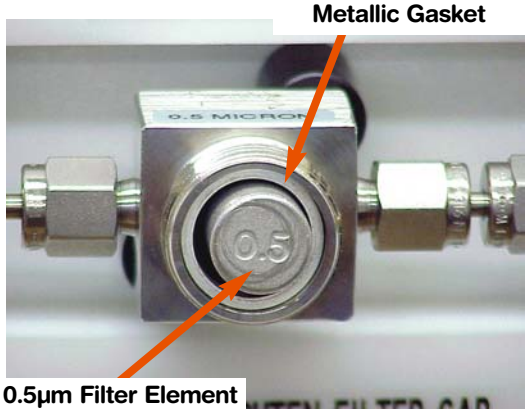
4. There is a metallic gasket enabling the seal (see picture below). Please be careful not to drop the Gasket to the floor.



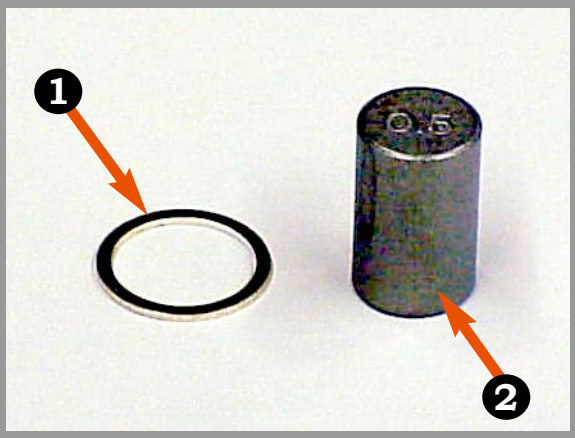
5. Carefully remove old Purge Line Filter and discard. Slight "side-to-side" motion may be necessary to "unseat" Filter Element.

6. Install a new Purge Line Filter Element (Cat# 8770-83B) paying attention to relocate the existing Metallic Gasket to insure a leak-free seal.



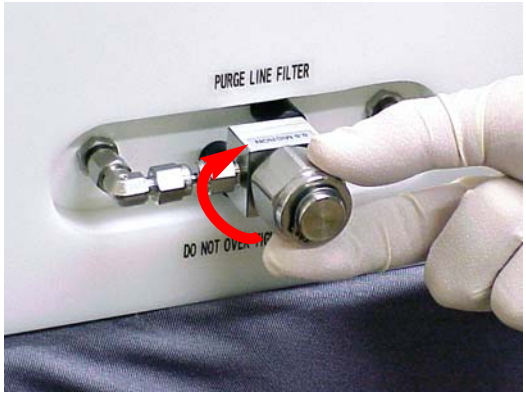
Purge Line Filter Element

1. Purge Line Filter Metallic Gasket
2. Purge Line 0.5µm Filter Element (Cat. # 8770-83B)



7. Place Filter Cap back onto filter housing and begin to re-assemble by hand. Tighten Purge Line Filter Cap with an adjustable wrench. DO NOT OVER-TIGHTEN.

NOTE:
Snug Filter Cap without excessive force as mounting bracket damage could result.



It is recommended that the "Purge Line 0.5µm Filter Element" be replaced every 3-6 months with regular use. Change more frequently with heavy use.

Please contact tousimis Technical Support with any questions:
Tel.# 301.881.2450, 9am-5pm EST (M-F)
Fax # 301.881.5394
Email: techsupport@tousimis.com

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